

**APPENDIX C:**  
MSDS FOR DYNOSEIS

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# DYNO

Dyno Nobel

**MATERIAL SAFETY DATA SHEET**  
**DYNO NOBEL INC.**  
**11<sup>TH</sup> FLOOR CROSSROADS TOWER**  
**SALT LAKE CITY, UTAH 84144**  
PHONE: 801-364-4800 FAX: 801-328-6452  
E-MAIL: DNNA.HSE@AM.DYNONOBEL.COM  
FOR 24 HOUR EMERGENCY CALL 800-424-9300

**MSDS# 1019**

**DATE: 05/09/03**

**Supersedes MSDS**  
**1019 03/01/02**

## SECTION I - PRODUCT IDENTIFICATION

**Trade Name(s):** D-GEL<sup>TM</sup> 1000  
DYNOSPLIT<sup>®</sup>: D1, D3/4, D 7/B  
EXTRA GELATIN: 40%, 75%  
GELAPRIME<sup>®</sup> F  
UNIGEL<sup>®</sup>  
UNIMAX<sup>®</sup>  
VIBROGEL<sup>®</sup>: 1,3  
Z POWDER<sup>TM</sup>

Oil Well Explosive 80%  
Oil Well Explosive 100%  
STONECUTTER<sup>TM</sup>  
RED H<sup>®</sup> A  
RED H<sup>®</sup> B  
IRECOGEL<sup>®</sup> B  
IRESPLIT<sup>®</sup> D  
IRESPLIT<sup>®</sup> D-1  
IP: 724, 738

**Product Class:** Packaged Dynamites and Blasting Gels

**Product Appearance & Odor:** Powdery to gelatinous solid, light tan to dark brown color. Faint, waxy odor.

**DOT Hazard Shipping Description:** Explosive, blasting, type A 1.1D UN0081 II

**NFPA Hazard Classification:** Not Available (See Section IV - Special Fire Fighting Procedures)

## SECTION II - HAZARDOUS INGREDIENTS

Ingredients:	CAS#	% (Range)	TLV-ACGIH
Nitroglycerin (NG)	55-63-0	1-20	0.05 ppm
Ethylene Glycol Dinitrate (EGDN)	628-98-8	8-78	0.05 ppm
Nitrocellulose	9004-70-0	0-6	No Value Established
Ammonium Nitrate	6484-52-2	0-75	No Value Established
Sodium Nitrate	7631-99-4	0-50	No Value Established
Sulfur <sup>*</sup>	7704-34-9	0-4	No Value Established

\*This ingredient is not found in most of the products listed above.

Ingredients, other than those mentioned above, as used in this product are not hazardous as defined under current Department of Labor regulations.

## SECTION III - PHYSICAL DATA

**Boiling Point:** Not Applicable

**Vapor Density:** Not Applicable

**Percent Volatile by Volume:** Not Applicable

**Evaporation Rate (Butyl Acetate = 1):** Not Applicable

**Vapor Pressure:** Not Applicable

**Density:** 0.8-1.48 g/cc

**Solubility in Water:** Ammonium and sodium nitrates are completely soluble. NG and EGDN are very slightly soluble.

#### **SECTION IV - FIRE AND EXPLOSION HAZARD DATA**

Flash Point: Not Applicable

Flammable Limits: Not Applicable

Extinguishing Media: (See Special Fire Fighting Procedures section.)

Special Fire Fighting Procedures: Do not attempt to fight fires involving explosive materials. Evacuate all personnel to a predetermined safe location, no less than 2,500 feet in all directions.

Unusual Fire and Explosion Hazards: Can explode or detonate under fire conditions. Burning material may produce toxic vapors.

#### **SECTION V - HEALTH HAZARD DATA**

##### **Effects of Overexposure**

Eyes: May cause irritation, redness and tearing.

Skin: Contact may result in headache, nausea and blood vessel dilation.

Ingestion: May result in headache, nausea, intestinal upset and blood vessel dilation.

Inhalation: May result in headache, nausea and blood vessel dilation.

Systemic or Other Effects: None known.

##### **Emergency and First Aid Procedures**

Eyes: Irrigate with running water for at least fifteen minutes. If irritation persists, seek medical attention.

Skin: Remove contaminated clothing. Wash with soap and water.

Ingestion: Seek medical attention.

Inhalation: Remove to fresh air. If irritation persists, seek medical attention.

Special Considerations: None.

#### **SECTION VI - REACTIVITY DATA**

Stability: Stable under normal conditions. May explode when subjected to fire, supersonic shock, or high-energy projectile impact, especially when confined or in large quantities.

Conditions to Avoid: Keep away from heat, flame, ignition sources and strong shock.

Materials to Avoid (Incompatibility): Corrosives (mineral acids, bases, strong acids).

Hazardous Decomposition Products: Carbon Monoxide (CO), Hydrogen Sulfide (H<sub>2</sub>S), Nitrous Oxides (NO<sub>x</sub>), and Sulfur Oxides (SO<sub>x</sub>).

Hazardous Polymerization: Will not occur.

## **SECTION VII - SPILL OR LEAK PROCEDURES**

**Steps to be taken in Case Material is Released or Spilled:** Protect from all ignition sources. In case of fire evacuate area not less than 2,500 feet in all directions. Notify authorities in accordance with emergency response procedures. Only personnel trained in emergency response should respond. If no fire danger is present, and product is undamaged and/or uncontaminated, repackage product in original packaging or other clean DOT approved container. Ensure that a complete account of product has been made and is verified. Follow applicable Federal, State, and local spill reporting requirements. Contact of this product with water may result in a reportable release.

**Waste Disposal Method:** Disposal must comply with Federal, State and local regulations. If product becomes a waste, it is potentially regulated as a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR, part 261. Review disposal requirements with a person knowledgeable with applicable environmental law (RCRA) before disposing of any explosive material.

## **SECTION VIII - SPECIAL PROTECTION INFORMATION**

**Ventilation:** Forced ventilation may be necessary where natural ventilation is limited. Magazines containing NG and/or EGDN based explosives must be ventilated before entry.

**Respiratory Protection:** None normally required.

**Protective Clothing:** Chemical resistant (nitrile) gloves are suggested.

**Eye Protection:** Safety glasses are recommended.

**Other Precautions Required:** Inhalation and skin contact should be minimized to avoid headaches, nausea, and blood vessel dilation. Protective clothing should be changed daily, more often if contaminated.

## **SECTION IX - SPECIAL PRECAUTIONS**

**Precautions to be taken in handling and storage:** Store in cool, dry, well-ventilated location. Store in compliance with Federal, State, and local regulations. Keep away from heat, flame, ignition sources, and strong shock.

**Precautions to be taken during use:** Avoid breathing the fumes or gases from detonation of explosives. Use accepted safe industry practices when using explosive materials. Unintended detonation of explosives or explosive devices can cause serious injury or death.

**Other Precautions:** It is recommended that users of explosive materials be familiar with the Institute of Makers of Explosives Safety Library Publications.

## **SECTION X - SPECIAL INFORMATION**

**Chemical Name**  
Nitroglycerin

**CAS Number**  
55-63-0

**% By Weight**  
1-20

The reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR 372 may become applicable if the physical state of this product is changed to an aqueous solution. If an aqueous solution of this product is manufactured, processed, or otherwise used, the nitrate compounds category and ammonia listing of the previously referenced regulation should be reviewed.

### **DYNO NOBEL INC. Disclaimer**

The information contained herein is provided for reference purposes only and is intended only for persons having relevant technical skills. Because conditions and manner of use are outside of our control, the user is responsible for determining the conditions of safe use of the product. While the information is believed to be correct, DYNO NOBEL INC. shall in no event be responsible for any damages whatsoever, directly or indirectly, resulting from the publication or use of or reliance upon the information contained herein. (No warranty, either expressed or implied, of merchantability or fitness for a particular purpose, or of any nature with respect to the product, or to the information, is made herein.)



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**MSDS# 1093**

**DATE: 01/28/03**

**Supersedes MSDS**  
**1093 03/01/02**

### **SECTION I - PRODUCT IDENTIFICATION**

**Trade Name(s):** DYNOSEIS<sup>®</sup>, DYNOSEIS<sup>®</sup> PLUS  
Mini-DYNOSEIS<sup>®</sup>

**Product Class:** Seismic Explosive

**Product Appearance & Odor:** White solid with no odor.

**DOT Hazard Shipping Description:** Substances, explosives, n.o.s. (Sodium Perchlorate/Diethylene Glycol)  
1.1D UN0475 II

**NFPA Hazard Classification:** Not Available (See Section IV - Special Fire Fighting Procedures)

### **SECTION II - HAZARDOUS INGREDIENTS**

<b>Ingredients:</b>	<b>CAS#</b>	<b>% (Range)</b>	<b>TLV-ACGIH</b>
Sodium Perchlorate	7601-89-0	66-72	No Value Established
Diethylene Glycol	111-46-6	22-27	No Value Established

Ingredients, other than those mentioned above, as used in this product are not hazardous as defined under current Department of Labor regulations.

### **SECTION III - PHYSICAL DATA**

**Boiling Point:** Not Applicable

**Vapor Pressure:** Not Applicable

**Vapor Density: (Air = 1)** Not Applicable

**Density:** 1.6 - 1.85 g/cc

**Percent Volatile by Volume:** <5 (water)

**Solubility in Water:** Completely soluble

**Evaporation Rate (Butyl Acetate = 1):** <1

Sodium Perchlorate 209g / 100g water @ 25° C  
other components completely soluble

### **SECTION IV - FIRE AND EXPLOSION HAZARD DATA**

**Flash Point:** Not Applicable

**Flammable Limits:** Not Applicable

**Extinguishing Media:** (See Special Fire Fighting Procedures section).

**Special Fire Fighting Procedures:** Do not attempt to fight fires involving explosive materials. Evacuate all personnel to a predetermined safe location, no less than 2,500 feet in all directions.

**Unusual Fire and Explosion Hazards:** Can explode or detonate under fire conditions. Burning material may produce toxic vapors.

#### **SECTION V - HEALTH HAZARD DATA**

##### **Effects of Overexposure**

**Eyes:** Can cause irritation, redness and tearing.

**Skin:** Prolonged contact may cause irritation.

**Ingestion:** Moderately toxic by ingestion. Large amounts may be harmful if swallowed, and may lead to breathing difficulties.

**Inhalation:** Not a likely route of exposure. May cause dizziness, nausea or intestinal upset.

**Systemic or Other Effects:** No long-term health effects have been reported. Studies have shown that perchlorate ion has a significant reversible pharmacological effect on human thyroid tissue through competitive inhibition of thyroid iodine transport.

##### **Emergency and First Aid Procedures**

**Eyes:** Irrigate with running water for at least fifteen minutes. If irritation persists, seek medical attention.

**Skin:** Remove contaminated clothing. Wash with soap and water.

**Ingestion:** Seek medical attention.

**Inhalation:** Remove to fresh air.

**Special Considerations:** None.

#### **SECTION VI - REACTIVITY DATA**

**Stability:** Stable under normal conditions, may explode when subjected to fire, supersonic shock or high-energy projectile impact, especially when confined or in large quantities.

**Conditions to Avoid:** Keep away from heat, flame, friction, impact, electrostatic discharge, ignition sources and strong shock. Do not drop load charges down boreholes.

**Materials to Avoid (Incompatibility):** Composites (strong acids and bases or alkalis).

**Hazardous Decomposition Products:** Nitrogen Oxides (NO<sub>x</sub>), Carbon Monoxide (CO), Chlorine (Cl<sub>2</sub>), and Hydrogen Chloride (HCl).

**Hazardous Polymerization:** Will not occur.

### SECTION VII - SPILL OR LEAK PROCEDURES

**Steps to be taken in Case Material is Released or Spilled:** Protect from all ignition sources. In case of fire evacuate area not less than 2,500 feet in all directions. Notify authorities in accordance with emergency response procedures. Only personnel trained in emergency response should respond. If no fire danger is present, and product is undamaged and/or uncontaminated, repackage product in original packaging or other clean DOT approved container. Ensure that a complete account of product has been made and is verified. Follow applicable Federal, State and local spill reporting requirements.

**Waste Disposal Method:** Disposal must comply with Federal, State and local regulations. If product becomes a waste, it is potentially regulated as a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR, part 261. Review disposal requirements with a person knowledgeable with applicable environmental law (RCRA) before disposing of any explosive material.

### SECTION VIII - SPECIAL PROTECTION INFORMATION

**Ventilation:** Not required for normal handling.

**Respiratory Protection:** None normally required.

**Protective Clothing:** Non-permeable gloves and work clothing that reduce skin contact are suggested.

**Eye Protection:** Safety glasses are recommended.

**Other Precautions Required:** None.

### SECTION IX - SPECIAL PRECAUTIONS

**Precautions to be taken in handling and storage:** Store in cool, dry location. Store in compliance with all Federal, State and local regulations. Keep away from heat, flame, friction, impact, electrostatic discharge, ignition sources or strong shock.

**Precautions to be taken during use:** Avoid breathing the fumes or gases from detonation of explosives. Use accepted safe industry practices when using explosive materials. Do not drop load charges down boreholes. Unintended detonation of explosives or explosive devices can cause serious injury or death.

**Other Precautions:** It is recommended that users of explosives material be familiar with the Institute of Makers of Explosives Safety Library publications.

### SECTION X - SPECIAL INFORMATION

This product contains the following substances that are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

<u>Chemical Name</u>	<u>CAS Number</u>	<u>% By Weight</u>
None Applicable		

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